

Name: _____

Per: _____

Forces & Motion Lab 1: Uncommon Motion

Access website <http://phet.colorado.edu/> > Play with sims > Physics > Forces and Motion: Basics > Download

TUG OF WAR - be sure to check the boxes for “Sum of Forces” and “Values” and uncheck “Sound”

For each simulation shown, draw each team’s forces, including the values, as well as the net force (aka Sum of Forces). Then answer the questions relating to each situation using complete sentences.

1.



- Describe the resulting motion of the simulation and explain why this must be true.
- Do results ever change if you always have the same people pulling on either side? Pause simulation each time you add another puller to each team then press “Go!” once both sides are even.

2.



- Explain why the blue team wins the tug of war.

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3.



- a. Allow the simulation to run for a time, then, while the simulation is still running (do not allow red to win), add the blue puller to make it even. Describe the resulting motion and explain who wins and why.

Show the new forces and net force



4. With the same start as question 3, what must occur in order for the blue team to win? Why must this be true?

MOTION - be sure to check the all boxes in the legend.

Place a crate on the skateboard and apply a constant force to the object. Force applied: _____

5. Describe happens to the speed while the force is being applied?

6. Describe happens to the speed once the force is stopped being applied?

Place the fridge on the skateboard and apply the same constant force as before.

7. Does the fridge's speed increase faster, slower, or at the same rate as the crate?

8. Describe what happens to the speed of the fridge once the force is stopped being applied?

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Newton's 1st Law & Resulting Motion Lab 1: Laws of the Force

For each statement below, complete the sentence by using “balanced” (meaning equal to 0) or “unbalanced” (meaning not equal to 0). Then explain how the lab demonstrated this.

1. For an object at rest, to start moving, the sum of the forces (net force) acting on it must be _____
2. For an object moving at a constant velocity, to keep moving at a constant velocity, the sum of the forces (net force) acting on it must be _____
3. For an object moving at a constant velocity to speed up, the sum of the forces (net force) acting on it must be _____
4. For an object moving at a constant velocity to slow down, the sum of the forces (net force) acting on it must be _____

From your observations in the lab, complete the two statements about the resulting motion of an object. These would be considered a law. A law is a statement that holds true in all situations, so make sure your lab does not contradict your statement. If one part of your experience / observation in the lab refute your law it doesn't work.

1. When the net force acting on an object is zero then...
2. When the net force acting on an object is not zero then...